

CLAIMS:

1. An immunogenic detoxified protein comprising the amino acid sequence of subunit A of a cholera toxin (CT-A) or a
5 fragment thereof or the amino acid sequence of subunit A of an *Escherichia coli* heat labile toxin (LT-A) or a fragment thereof wherein the amino acids at, or in positions corresponding to, Ser-63 and Arg-192 are replaced with another amino acid.
- 10 2. A vaccine composition comprising an immunogenic detoxified protein according to claim 2 and a pharmaceutically acceptable carrier.
- 15 3. A vaccine composition according to claim 2 further comprising an adjuvant.
4. A vaccine composition according to claim 2 further containing a second immunogenic antigen.
- 20 5. A DNA sequence encoding an immunogenic detoxified protein according to claim 1.
6. A vector carrying a DNA according to claim 5.
- 25 7. A host cell line transformed with the vector according to claim 6.
8. A process for the production of an immunogenic
30 detoxified protein according to any one of claim 1 comprising culturing a host cell according to claim 7.
9. A process for the production of a DNA according to claim 5 comprising the steps of subjecting a DNA encoding
35 a CT-A or an LT-A or a fragment thereof to site-directed mutagenesis.
10. A method of vaccinating a mammal against *Vibrio*

cholera or an enterotoxigenic strain of *Escherichia coli* comprising administering an immunologically effective amount of an immunogenic detoxified protein according to claim 1.

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11. A method for the prevention or treatment of diseases in a subject comprising administering to the subject an immunologically effective dose of a composition according to claim 4.

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12. A process for the formulation of a vaccine according to claim 2 comprising bringing an immunogenic detoxified protein according to claim 1 into association with a pharmaceutically acceptable carrier.

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13. A process for the formulation of a vaccine according to claim 3 comprising bringing an immunogenic detoxified protein according to claim 1 into association with an adjuvant.

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14. A process for the formulation of a vaccine according to claim 4 comprising bringing an immunogenic detoxified protein according to claim 1 into association with a second antigen.